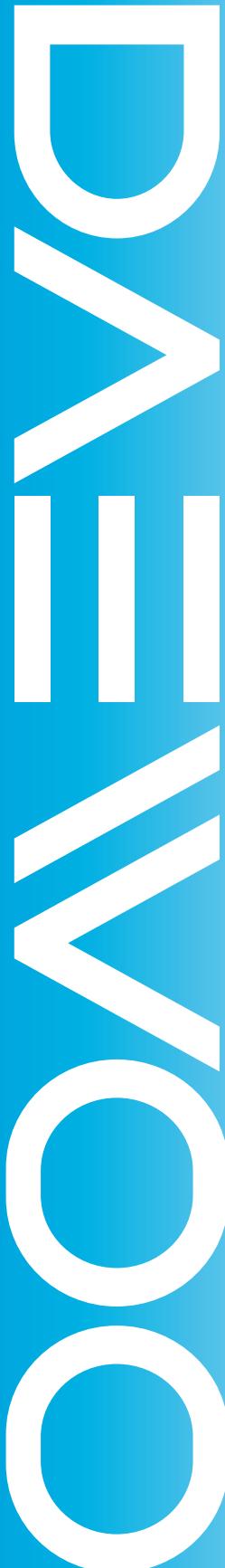


S/M No. :



# Service Manual

## Washing Machine

Model: KUF-320LD

✓ **Caution**

: In this Manual, some parts can be changed for improving, their performance without notice in the parts list. So, if you need the latest parts information, please refer to PPL(Parts Price List) in Service Information Center (<http://svc.dwe.co.kr>).

**DAEWOO**   
ELECTRONICS

Oct. 2010

# WASHING MACHINE

# SERVICE MANUAL

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# 1. OVERVIEW OF THE WASHING MACHINE

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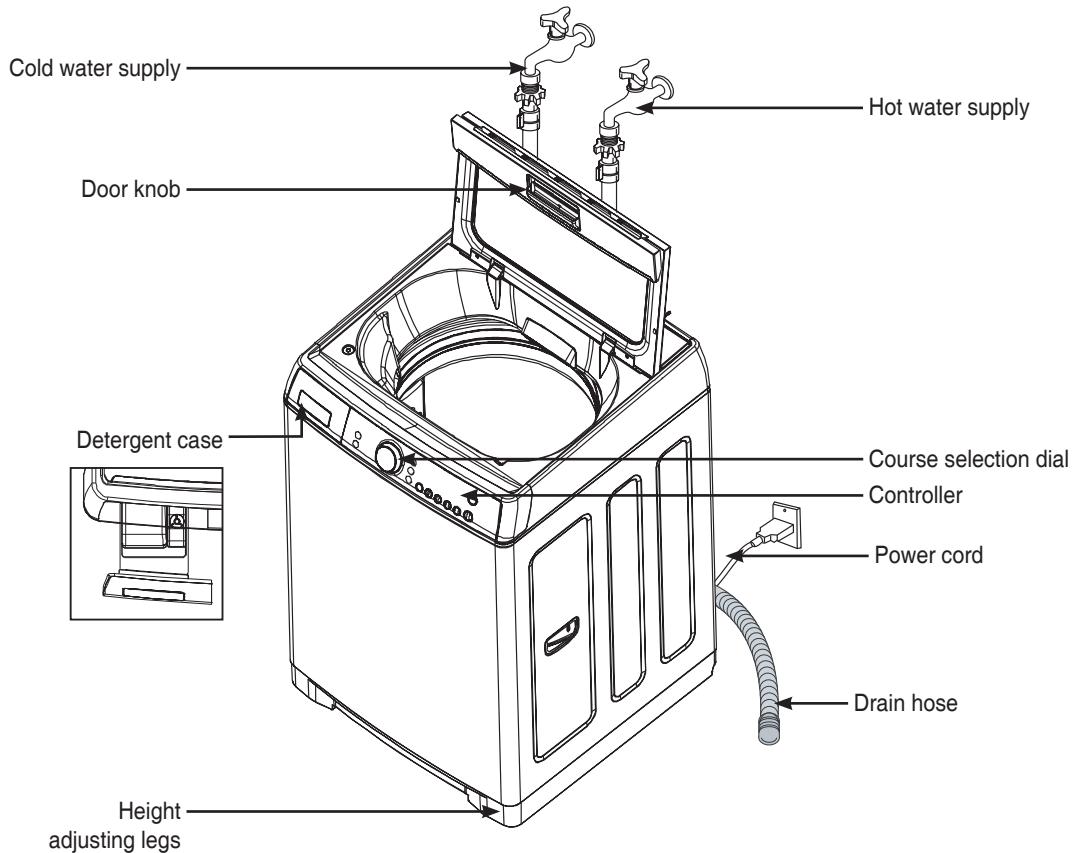
## 1. Product features (KUF-320LD)

- ◆ New style design
- ◆ Sanitary washing with air bubbles and nano-silver
- ◆ 99.9% perfect sterilization effects with nano-silver
- ◆ Odor removal with nano-silver
- ◆ Tub clean with nano-silver
- ◆ Powerful water current with DD motor
- ◆ Prevention of black mold in the back of the washing machine
- ◆ Front loading detergent case
- ◆ Night light
- ◆ Low vibration and noise
- ◆ Convenient washing operation with the space for feet

## 2. Comparison of product specifications

No	Items		KUF-320LD
1	Rated power consumption		550W
2	Wash/Spin capacity		15 Kg
3	Weight (Kg)	Net	60.5 Kg
		Gross	65.5 Kg
4	Exterior dimension (W x H x D)	Net	686 x 1,070 x 725
		Gross	730 x 1,120 x 780
5	Standard water volume		310L
6	Water feeding method		Single feeding
7	Water drain method		Natural drain
8	Rated voltage		110V/60Hz
9	Washing method		Air bubbles + powerful water current
10	Spinning method		Centrifugal spin dry
11	Washing courses		6 courses (Standard, Soaking, Wool/Knitwear, Quick, Sport shoes, Tub clean)
12	Water level control		Electronic sensing
13	Display		1888 LED display + Course LED
14	Filter		Two nano-magic filters
15	Level meter		Installed
16	Door switch		Door lock switch + magnetic reed switch
17	Motor		DD motor
18	Nano silver		Nano silver pulsator
19	Blades rpm		About 135 rpm
20	Drum spinning rpm		About 700 rpm
21	Water pressure		29 kPa ~ 784 kPa (0.3 kgf/cm <sup>2</sup> ~ 8 kgf/cm <sup>2</sup> )
22	Standard water level	6	124ℓ
		5	107ℓ
		4	97ℓ
		3	77ℓ
		2	66ℓ
		1	55ℓ

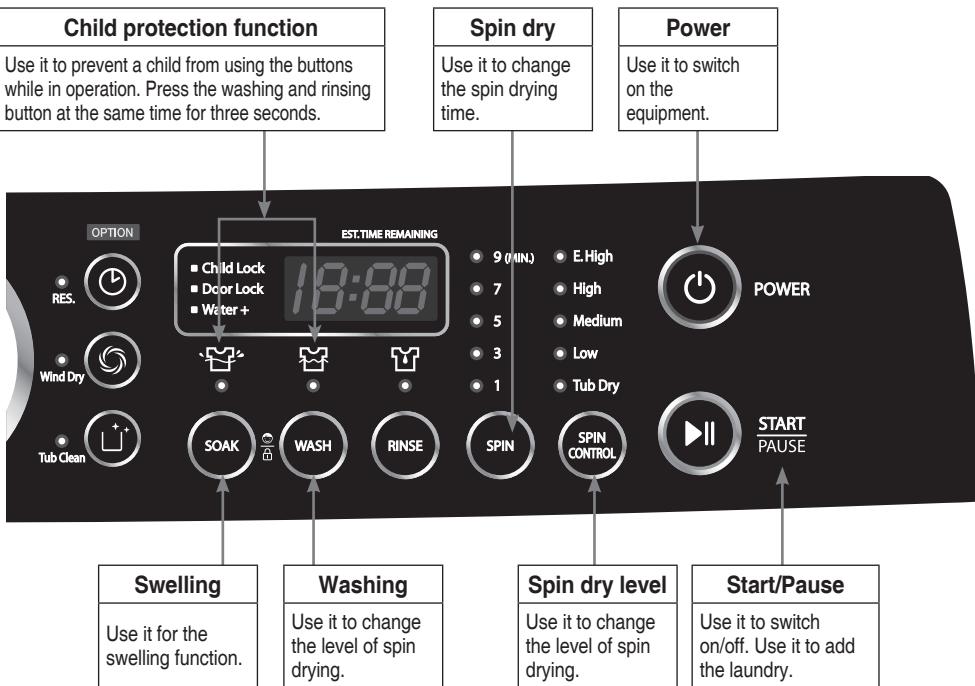
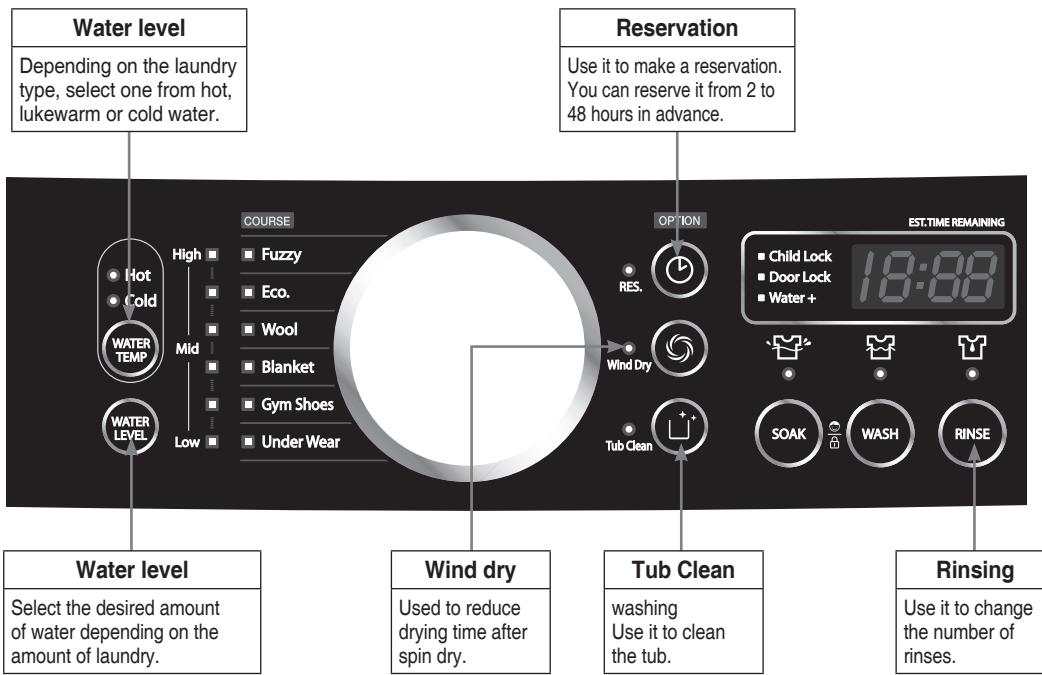
### 3. Names and functions of each part



## Accessories

Water hose fixer (two)	Water supply hoses (two)
User manual	Drain hose

## 4. Description of the control panel



## 2. WASHING COURSES AND THEIR CONTROLS

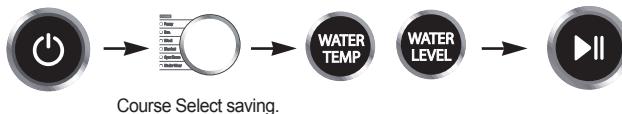
### 1. Fuzzy course

- Used for a general type of laundry.
- Artificial intelligence will determine the water level, the washing time, the rinsing count and the spin drying time depending on the amount of laundry.



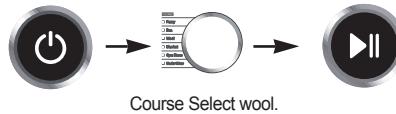
### 2. Eco course

- Economical course to save time and water.



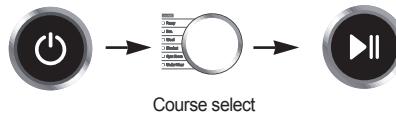
### 3. Wool course

- Used to wash sweaters, lingerie or stockings.
- Do not wash any clothes marked for dry cleaning or leather or cashmere. Must use neutral detergents.
- To prevent deformation, cold water and the high/med water level should be used.
- Do not exceed the recommended amount of laundry -2kg.



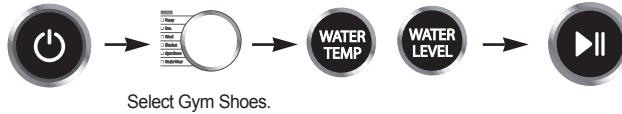
### 4. Blanket course

- Used for blanket or bedding that can be washed in water.
- If you pour detergent into the cold water it may stay undissolved between the blankets. Use liquid detergent.
- Do not use it for electric blanket or carpets.  
(It can cause damage to the washing machine or the laundry.)
- Do not exceed the recommended amount of laundry -3.5kg.



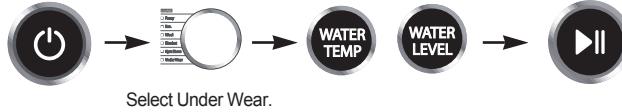
### 5. Gym Shoes

- Used for running shoes.
- Do not exceed the recommended amount of laundry – 2kg.
- Air bubble Water temperature Water height



### 6. Under Wear

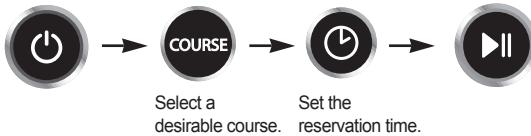
- Used to wash women's lingerie, which is very delicate.
- Liquid detergent recommended according to the washing method suggested for the clothes.



### 3. AIR BUBBLE UP WASHING AND BUTTON CONTROLS

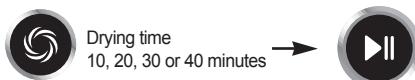
#### ■ Reservation washing

- Wool or washing tank cleaning can't be reserved.



#### ■ Wind dry

- Use a small amount of laundry.
- The Wind dry also removes moisture. It can reduce the drying time.



- \* If you need to adjust the washing/rinsing/drying time or count, then use each button before operation.  
If you want to change it during operation, then press the pause button before changing.
- \* If you open the door while washing, rinsing or spin drying, the operation will be halted and the time display window will display **LE**. Close the door and operation will resume.

### Progress of washing/rinsing and spin drying

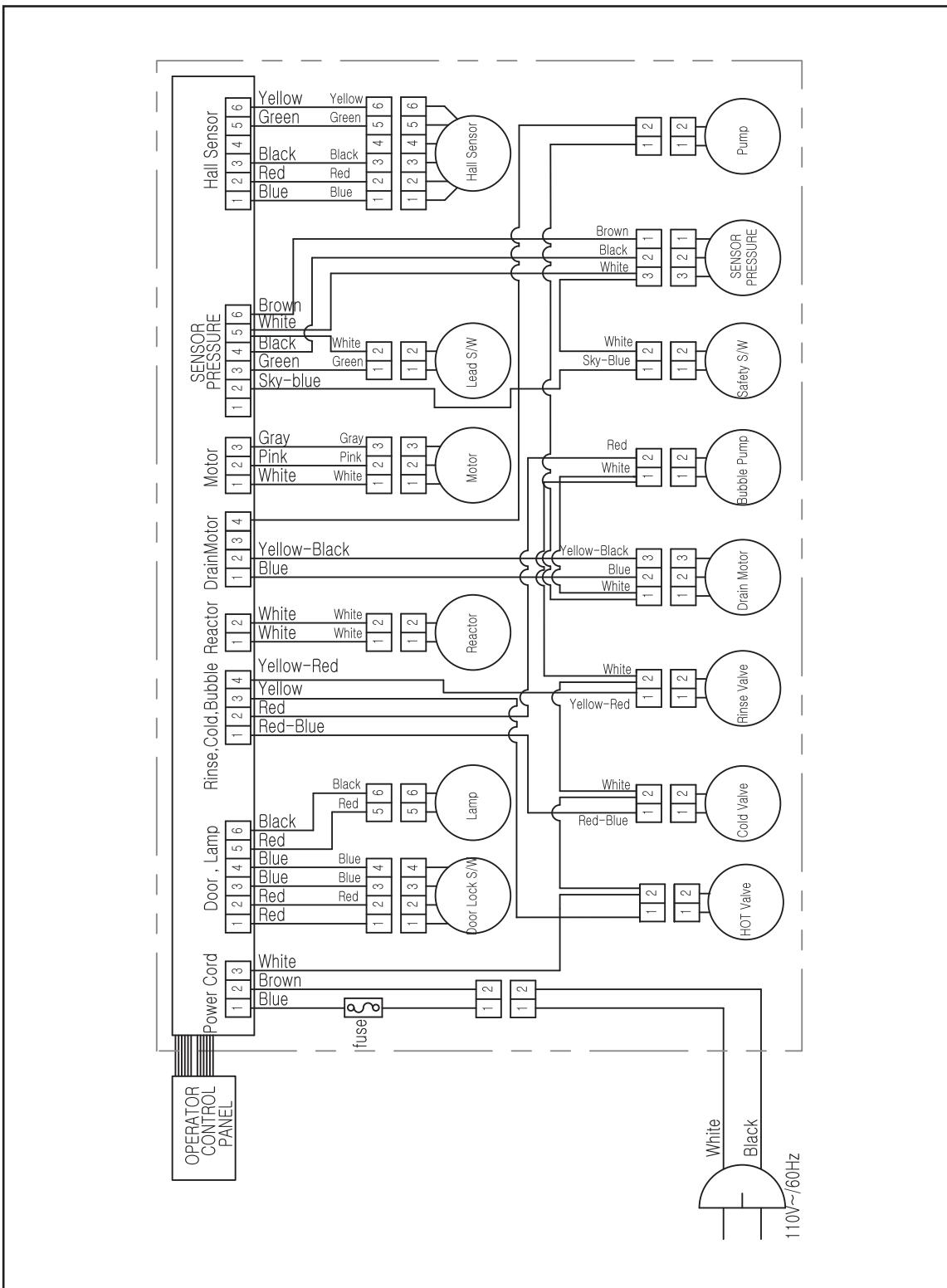
#### ■ If you only want washing, rinsing and spin drying, then do as follows.

- When the clean rinsing lamp is on, clean rinsing will proceed.
- In the wool or washing tank cleaning course, you can't control washing, rinsing, spin drying.



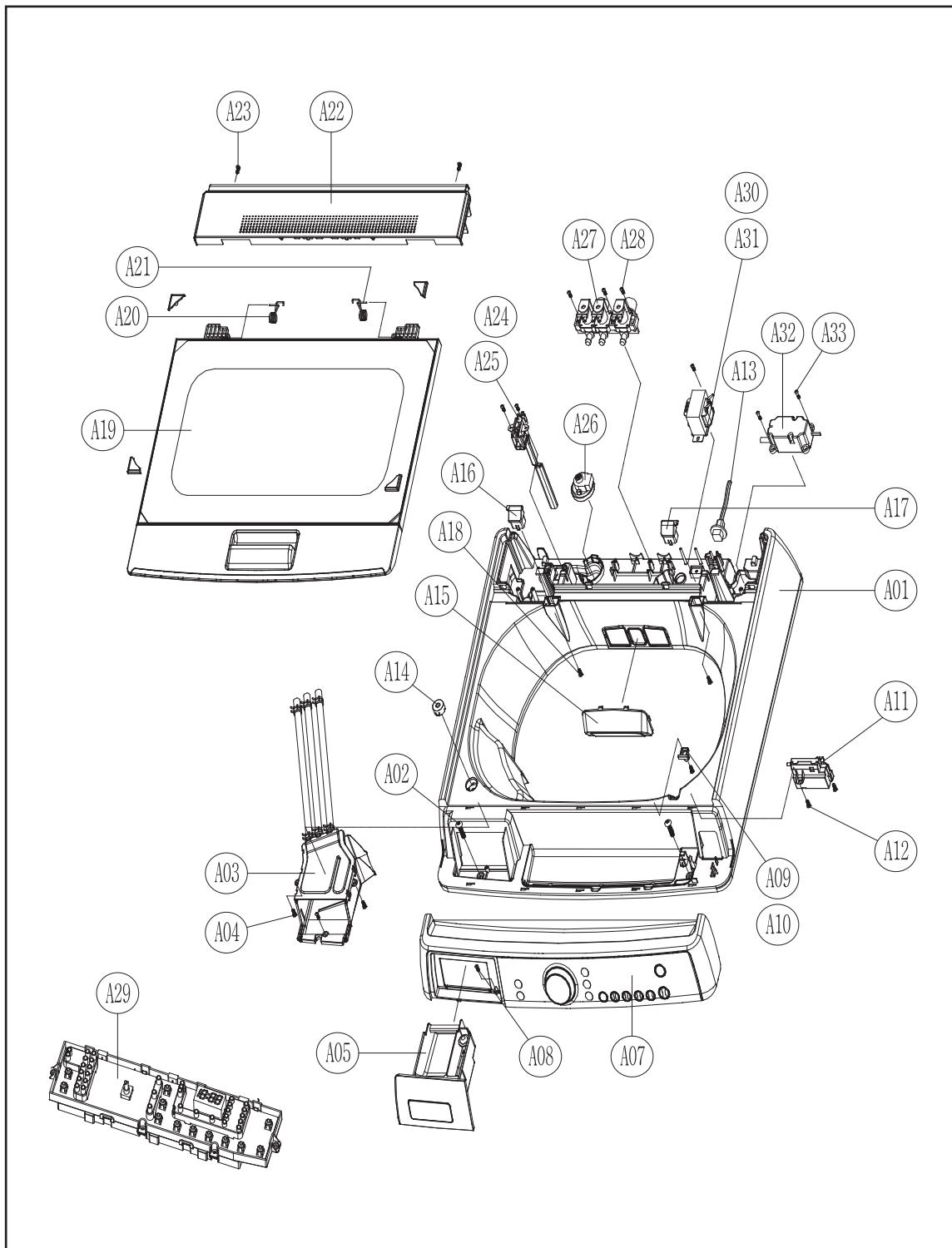
## 4. PARTS LIST BY ASS'Y

### 1. Wiring diagram(KUF-320LD)



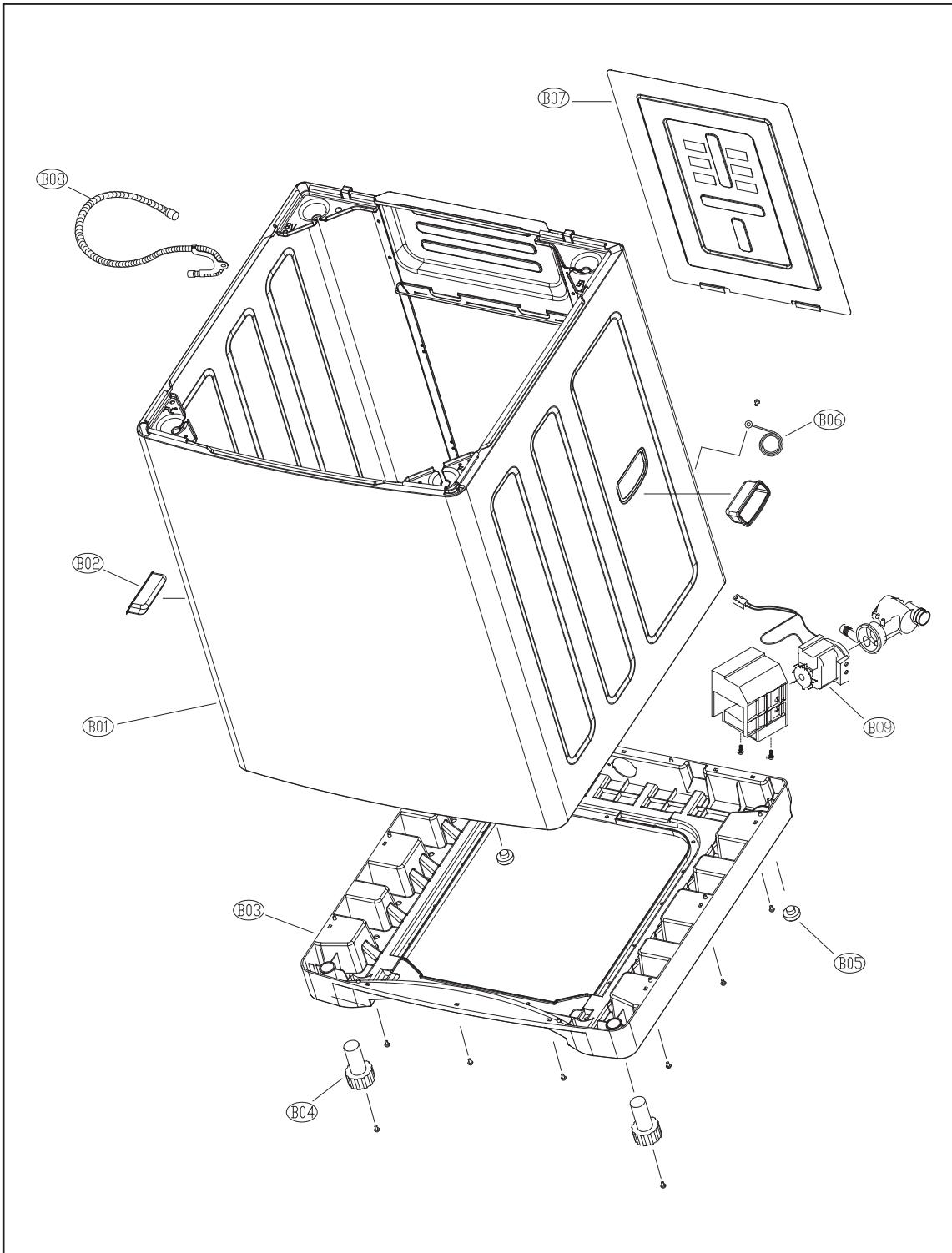
## 2. Exploded view diagram (KUF-320LD)

### ■ PLATE T ASS'Y (KUF-320LD)



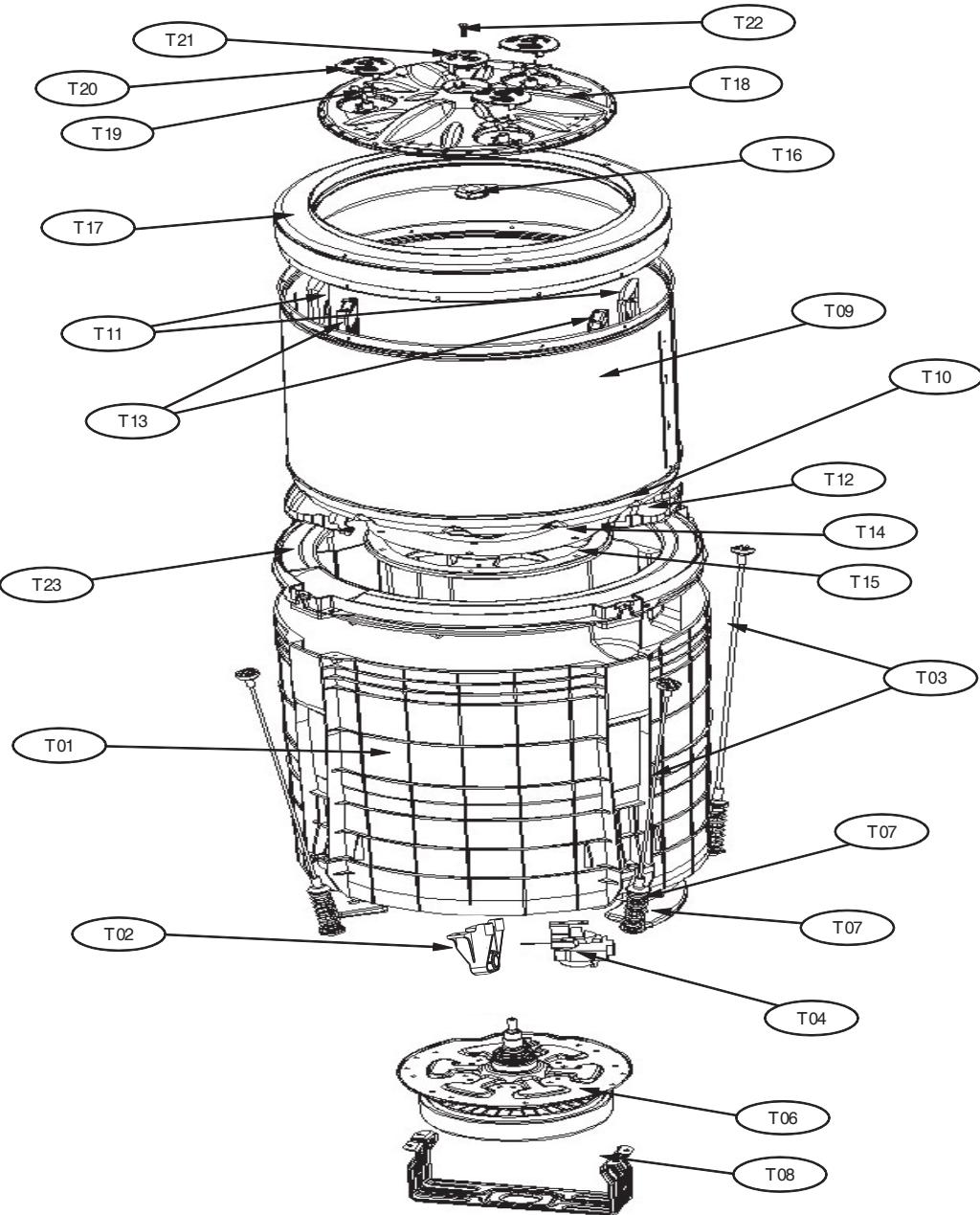
NO.	PART NAME	PART CODE	SPECIFICATIONS	Q'TY	REMARKS
A01	PLATE T	3614541710	UV SPRAY HOT,COLD,RINSE	1	
A02	SCREW TAPPING	7112503011	T1S,TRS,5*30 MFZN	2	
A03	INLET BOX AS	3617511400	DWF-320 COLD=730,HOT=800,RINSE=660	1	
A04	SCREW TAPPING	7122401408	T2S TRS 4x14 SUS	3	
A05	CASE DETERGENT AS	36111T2800	DWF-320L SPRAY,BLACK	1	
-	HARNESS AS	3612799Z10	320L,120V,FULL OPTION	1	
A07	PANEL FRONT AS	36142T2A01	DWF-320L, STANDBY, SPRAY	1	
A08	SCREW TAPPING	7122401411	T2S TRS 4x14 MFZN	1	
A09	SWITCH DOOR AS	3619048020	DWF-320, REED SWITCH	1	
A10	SCREW TAPPING	7122401411	T2S TRS 4x14 MFZN	1	
A11	SWITCH DOOR SAFETY	3619048600	SF-030A19 CH14T, NON ARM	1	
A12	SCREW TAPPING	7122401411	T2S TRS 4x14 MFZN	2	
A13	CORD POWER	3611339050	7A125V0.75SQ VCTFK TAIWAN LP-70 2.3M	1	
A14	UNIT LEVELER	3618971100	LEVELER, DWF-100AV/100AW	1	
A15	LAMP AS	36100T1E00	DWF-320L LAMP, SPRAY	1	
A16	HINGE DOOR L	3612904200	POM	1	
A17	HINGE DOOR R	3612904300	POM	1	
A18	SCREW TAPPING	7122401411	T2S TRS 4x14 MFZN	2	
A19	DOOR AS	36117ACP00	DWF-320L, GLASS DOOR AS	1	
A20	SPRING DOOR L	3615117400	DWF-320L	1	
A21	SPRING DOOR R	3615117500	DWF-320L	1	
A22	PANEL B	36142T2510	ABS UV_BASE, DWF-320L	1	
A22	COVER PANEL B	3611432100	DWF-320L, ABS	1	
A23	SCREW TAPPING	7122401411	T2S TRS 4x14 MFZN	2	
A24	SWITCH SAFETY	3619047030	320'S	1	
A25	SCREW TAPPING	7122401211	T2S TRS 4x12 MFZN	2	
A26	SENSOR PRESSURE AS	3614801635	CDN-15N,180°,3PIN,L1=740,L2=90	1	
A27	VALVE INLET	3615416310	DR-12AS:C-R.110-130V50/60HZ	1	
A28	SCREW TAPPING	7122401411	T2S TRS 4x14 MFZN	3	
A29	PCB AS	PRPSSW2D95	DWF-320L,T,J,C,BB,1W	1	
A30	REACTOR	3615800300	DWF-320L , RT-047UF	1	
A31	SCREW TAPPING	7122401411	T2S TRS 4x14 MFZN	1	
A32	UNIT BUBBLE PUMP AS	3618919955	CDK-116S,L=800,MOLEX(WH,TPA-RED)	1	
A33	SPECIAL SCREW	3616007400	T2S TRS 4x10+24	2	

## ■ CABINET ASS'Y (KUF-320LD)



NO.	PART NAME	PART CODE	SPECIFICATIONS	Q'TY	REMARKS
B01	CABINET SUB AS	PRCACAZJ10	DWF-320LKTC	1	ASSY PART
B01-1	CABINET	361081W800	SGCC 0.8T , BLACK, DWF-320LKTC	1	1-PIECE PART
B01-2	PLATE-UPPER	3614541300	SGCC 0.8T	1	
B01-3	PLATE-LOWER	3614541400	SGCC 0.8T	1	
B01-4	SUPP TUB FL	3615305300	SGCC 2.0T	1	
B01-5	SUPP TUB FR	3615305400	SGCC 2.0T	1	
B01-6	SUPP TUB BL	3615305500	SGCC 2.0T	1	
B01-7	SUPP TUB BR	3615305600	SGCC 2.0T	1	
B02	HANDLE CABINET	3612603300	PP , GY-349A	2	
B03	BASE U	3610394100	PP	1	
B04	LEG ADJUST AS	3617702122	VE	2	
B05	FOOT	3612100340	VE , FRONT , SBR	2	
B06	HARNESS OUTER	3610068700	50/0.18 , GREEN , ST710489-2	1	
B07	COVER BACK	3611413605	SGCD 0.4T	1	
B08	HOSE	4500D08220	ID=8.0	1	
B09	UNIT DRAIN PUMP	36189S1400	LOW/60HZ,CU 40W,L=1400,BB CUT,B30-3		

## ■ TUB ASS'Y (KUF-320LD)



NO.	PART NAME	PART CODE	SPECIFICATIONS	Q'TY	REMARKS
T01	TUB O	3618830300	FRPP, DWF-320	1	
-	HOSE OVERFLOW	3613208901	PELD L=280mm	1	
T02	CLUTCH DRAIN AS	3615418600	DWF-320LPSP	1	
T03	SUSPENSION AS	36100T1J00	DWF-320, VP TYPE, SPRING 10 1/2 TURN WH	4	
T04	DRAIN MOTOR	36196TAX00	SV-HJT24D, 100-110 50/60HZ	1	
-	SCREW TAPPING	3616007001	SCM24H, 6.5x24 101S	3	
T06	UNIT MOTOR AS	36189S1C00	DD TYPE, CLUTCH+SATOR+ROTOR	1	
-	CLUTCH AS	3619301900	DD CLUTCH, DWF-320	1	
-	UNIT STATOR AS	36189S1A00	DWF-320'S, AMOTEC	1	
-	UNIT ROTOR AS	36189S1B00	DWF-320'S ROTOR AS, AMOTEC	1	
-	SCREW TAPPING	3616007001	SCM24H, 6.5x24 101S	8	
-	SCREW TAPPING	3616029800	SCM24H, 6.5x30	6	
T07	BALANCER WEIGHT	3616111310	FDC450, 1.75KG, EPOXY, COATING	2	
-	WASHER EPDM	3616065800	EPDM ID7.5 OD22 3.0T	6	
-	WASHER PLAIN	3616065700	SCP1 ID8.4 OD22 2.0T	6	
-	SCREW TAPPING	3616029800	SCM24H, 6.5x30	6	
T08	PROTECTOR MOTOR	3618345700	SGCC 1.6T	1	
-	SPECIAL SCREW	3616007001	SCM24H, 6.5x24 101S	4	
-	TUB I AS	3618830600	DWF-320	1	
T09	TUB I	3618830500	SUS 0.5T, 1-PIECE	1	
T10	TUB U	3618830400	SUS 1.2T	1	
T11	FRAME FILTER	36122UDF00	PP, TB53	2	
-	SCREW TAPPING	7122400814	T2S TRS 4x14 SUS	8	
T12	GUIDE FILTER	3612512000	PP	2	
-	SCREW TAPPING	3616051629	SUS430 T2 TRS 5.5x16	4	
T13	FILTER AS	3611911400	DWF-320, MAGIC FILTER AS	2	
T14	CUSHION FLANGE	3611575200	ABS SHEET 0.5T	1	
T15	FLANGE TUB	3617201M00	ALDC12	1	
-	SPECIAL BOLT AS	3616065400	SUS M8x15, SCREW+WASHER+ SPRING/W	6	
T16	SPECIAL NUT	3616064200	ZNDC	1	
T17	BALANCER AS	3616111200	DWF-320, 5,400G	1	
-	SPECIAL SCREW	3616051629	SUS430 T2 TRS 5.5x16	4	
T18	PULSATATOR AS	3619708500	DWF-320, 3-IMPELLER	1	
T19	FAN IMPELLER	3611885600	PP	3	
T20	CAP IMPELLER	3610919500	ABS, DWF-320	3	
T21	CAP PULSATATOR	3610915800	ABS, DWF-320	1	
T22	SPECIAL SCREW	3616062629	STS430 6x26.5	1	
T23	COVER TUB O	3611431800	PP	1	
-	SCREW TAPPING	3616051629	SUS430 T2 TRS 5.5x16	4	

### 3. Disassembly procedure (KUF-320LD)

#### 1. Front panel disassembly procedure (KUF-320LD)

1. Pull out the detergent box



2. Remove the set screws from Panel F



3. Push the front panel to the left and separate the clamping hook



4. Remove the set screws for the PCB assembly and separate the PCB assembly.



#### 2. Rear panel disassembly procedure (KUF-320LD)

1. Remove the rear panel set screws.



2. Lift up and separate the rear panel.



## 5. CIRCUITS

### 1. Sequence chart

#### ■ SEQUENCE CHART(KUF-320LD)

Classification		Time	FUZZY						ECO	WOOL	
			Minimum	Minimum /Low	Low	Medium	Medium /High	High			
WASH	Sensing		■	■	■	■	■	■	■		
	Water supply	4min.	■	■	■	■	■	■	■	■	
	Soak	30min.									
	Washing	30min.							17min.		
		17min.	9min.	11min.	13min.	15min.	15min.	■			
		15min	■	■	■	■	■	■			
		6min.	■	■	■	■	■	■	■	■	
RINSE	Drain	2min.	■	■	■	■	■	■	■	■	
	Balancing spin		■	■	■	■	■	■	■	■	
	Mid. spin	5min.	■	■	■	■	■	■			
		4min.	■	■	■	■	■	■	■	■	
	Water supply	4min.	■	■	■	■	■	■	■	■	
	Rinse 1	3min.	■	■	■	■	■	■			
			■	■	■	■	■	■			
		2min.	■	■	■	■	■	■	■ Rinse	■	
	Drain	2min.	■	■	■	■	■	■			
	Balancing spin		■	■	■	■	■	■			
SPIN	Mid. spin	5min.	■	■	■	■	■	■			
			■	■	■	■	■	■			
		4min.	■	■	■	■	■	■			
	Water supply	4min.	■	■	■	■	■	■			
	Rinse 2	3min.	■	■	■	■	■	■			
			■	■	■	■	■	■			
		2min.	■	■	■	■	■	■			
Remaining time display			51	53	55	57	57	59	30	44	
NOTE		1. Only one rinse will be applied to ECO course. 2. Spin time shown inside the parenthesis is the number shown on the display and the user select time is shown at the front. (Example) 9 min. (12 min.) → 12 min. is displayed when user selects 9 minutes.									

## ■ SEQUENCE CHART2 (KUF-320LD)

Classification	Time	Blanket	Sport shoes	Underwear	Tub clean
W A S H	Sensing				
	Water supply	4min.	■	■	■
		30min.			■ 120min.
	Soak	20min.	■		■
		15min	■	■	■
		10min.	■	■	■
	Drain	2min.	■	■	■
	Balancing spin		■	■	■
			■		
	Mid. spin	5min.	■		
R I N S E		4min.	■		■
	Water supply	4min.	■	■	■
			■		
	Rinse 1	3min.	■	■	■
		2min.	■	■	■
	Drain	2min.	■	■	■
	Balancing spin		■		■
			■		
	Mid. spin	5min.	■		
		4min.	■		■
S P I N	Water supply	4min.	■		
			■		
	Rinse 2	3min.	■		
		2min.	■	■	■
	Drain	2min.	■		
	Balancing spin		■		
			■		
	Mid. spin	5min.	■		
		4min.	■		
	Water supply	4min.	■		
Remaining time display		76	47	46	180
NOTE	1. Blanket course has 3 rinse stages. 2. Sport shoes course does not have mid-spin during the rinse stage and the main spin is done at around 400 rpm.				

## 2. Operation for each button

Button	Operation												
Power	<ol style="list-style-type: none"> <li>Micro switch type is used to meet the 0.5W of standby power consumption requirement.           <ul style="list-style-type: none"> <li>Tact switch type is used for other regions that do not have 0.5W requirement. (D16 setting of F-PCB; D16 connected → Tact SW, D16 disconnected → Encoder SW)</li> </ul> </li> <li>When the “Power” button is pressed, the power supply relay is engaged and “---” will be shown on the display.</li> <li>All other LEDs are off.</li> <li>Automatic power off function:</li> <li>The power will be turned off immediately after finishing the washing course.</li> <li>The power will also be turned off when there is no button input for 10 minutes.</li> <li>Automatic power off function will be disabled if an error occurs.</li> </ol>												
Start/Pause	<ol style="list-style-type: none"> <li>Fuzzy course selected if the Start button is pressed without selecting any course.</li> </ol>												
Water temp	<ol style="list-style-type: none"> <li>Select the water valve to use.</li> <li>This button will be removed for “Single Water” region</li> <li>The sequence of selection is “Cold → Cold + Hot → Hot → Cold”.</li> <li>Only cold water is used for the Wool course and this button does not affect the operation. (Internal water): Hot water is used for Tub Clean, Blanket, and Sport shoes courses</li> <li>‘Cold’ water will be selected with the ‘Fuzzy’ course if this button is pressed in the initial state.</li> <li>Water valve operation at each stage depending on water temperature selection</li> </ol> <table border="1"> <thead> <tr> <th>Selection</th><th>Wash</th><th>Rinse</th></tr> </thead> <tbody> <tr> <td>Cold</td><td>Cold value</td><td>Cold valve</td></tr> <tr> <td>Cold + Hot</td><td>Cold +Hot valve</td><td>Cold + Hot valve</td></tr> <tr> <td>Hot</td><td>Hot valve</td><td>Cold + Hot valve</td></tr> </tbody> </table>	Selection	Wash	Rinse	Cold	Cold value	Cold valve	Cold + Hot	Cold +Hot valve	Cold + Hot valve	Hot	Hot valve	Cold + Hot valve
Selection	Wash	Rinse											
Cold	Cold value	Cold valve											
Cold + Hot	Cold +Hot valve	Cold + Hot valve											
Hot	Hot valve	Cold + Hot valve											
UE	<ol style="list-style-type: none"> <li>The order of selection is Minimum → Minimum/Low → Medium → Medium-High → High.</li> <li>LED blinks sequentially during the load sensing stage.</li> <li>Load sensing will not be enabled when water level is selected before the load sensing stage, and the wash time will be set to the default value (15 min).</li> <li>If water level is set after load sensing, only the water level will be changed while the wash time remains to be the value set by the load sensing stage.</li> <li>Water level cannot be changed for Tub Clean course</li> <li>Water level section sequence for each course           <ul style="list-style-type: none"> <li>Fuzzy, ECO, and Sport shoes: Minimum → Minimum/Low → Low → Medium → Medium/High → High → Minimum</li> <li>Wool: Medium → Medium/High → High → Medium</li> <li>Blanket: Medium → Medium/High → High → Medium</li> <li>Underwear: Minimum → Minimum/Low → Minimum</li> </ul> </li> <li>If the water level button is selected before load sensing in Fuzzy course, Medium/High will be selected.</li> <li>If the water level button is selected before load sensing in ECO course, Minimum/Low will be selected.</li> <li>If the water level button is selected at the initial state, Medium level and Fuzzy course will be selected.</li> </ol>												

<b>Button</b>	<b>Operation</b>
<b>Soak</b>	<ol style="list-style-type: none"> <li>1. Soak time can be selected for all courses except the Wool course</li> <li>2. Soak time is set to 120 minutes for Tub Clean course and 30 minutes for all other courses.</li> <li>3. If the Soak button is pressed before washing, the default wash time for each course will be selected automatically.</li> </ol>
<b>Wash</b>	<ol style="list-style-type: none"> <li>1. Wash time can be set from 0 min to 120 min in one minute step.</li> <li>2. The washing time will be incremented every 0.3 seconds while pressing this button. When the button is released, the selected washing time will blink for three seconds and then overall course time will be shown on the display.</li> <li>3. It can be selected for all courses except the Wool course.</li> <li>4. Selection of wash time for each course <ul style="list-style-type: none"> <li>• Fuzzy, Blanket, Tub Clean, ECO,</li> <li>• Sport shoes, and Underwear: 0 ~ 20 min</li> </ul> </li> <li>5. Only washing time can be selected if the Wash button is pressed right after power on.</li> <li>6. If the washing time is set to 0 when the soaking is selected, the soaking will start immediately.</li> </ol>
<b>Rinse</b>	<ol style="list-style-type: none"> <li>1. The sequence of selection is One rinse → One main rinse → Two rinses → Two main rinses → Three rinses → Three main rinses → Four rinses → Four main rinses → Five rinses → Five main rinses → No rinse.</li> <li>2. The number of rinse is incremented every 0.7 seconds while pressing this button. Upon releasing the button the selected number of rinse blinks for 3 seconds and the total course time will be shown on the display.</li> <li>3. This cannot be changed for the Wool course.</li> <li>4. Main rinse cannot be selected for the Blanket or Tub Clean course.</li> <li>5. Up to three rinse stages can be selected for ECO course with the selection sequence of “rinse 1 → main rinse 1 → rinse 2 → main rinses 2 → rinses 3 → main rinses 3 → No rinse”.</li> <li>6. Press this button right after power on to do Rinse only.</li> <li>7. When the operation starts with the rinse operation, water filling for rinse mode is performed before the rinse operation.</li> </ol>
<b>Spin time</b>	<ol style="list-style-type: none"> <li>1. The sequence of selection is 1 min → 3 min → 7 min → 9 min → 0.</li> <li>2. Spin time cannot be changed for the Wool, Sport shoes, and Tub Clean courses.</li> <li>3. If the Spin button is pressed right after power on, spin time will be set to 5 min and spin speed will be set to HIGH.</li> </ol>
<b>Spin speed</b>	<ol style="list-style-type: none"> <li>1. The sequence of selection is NIGHT TIME → LOW → MEDIUM → HIGH → Ex. HIGH.</li> <li>2. Spin time has to be selected first before setting the speed.</li> <li>3. Spin speed cannot be changed for the Wool, Sport shoes, and Tub Clean courses.</li> <li>4. Spin speed selection for each course <ul style="list-style-type: none"> <li>• FUZZY, ECO, Blanket course: the selection sequence is NIGHT TIME → LOW → MEDIUM → HIGH → Ex. HIGH → NIGHT TIME</li> <li>• Underwear: The selection sequence is NIGHT TIME → LOW → MEDIUM → NIGHT TIME.</li> </ul> </li> <li>5. If the Spin speed button is pressed in the initial state, the spin time will be set to ‘5 min’ and the spin speed will be set to ‘HIGH’.</li> </ol>

Button	Operation
Air wash	<ol style="list-style-type: none"> <li>The sequence of selection is 10 min → 20 min → 30 min → 40 min → 50 min → 60 min → 0. (5 min of balance spin time will be added in certain period of time after the selection by button.)</li> <li>Air wash time is incremented by 10 min while pressing the button. When the button is released, the selected air wash time blinks for three seconds and total course time will be shown on the display.</li> <li>This cannot be selected for the Wool, Underwear, and Tub Clean courses.</li> </ol>
Reservation	<ol style="list-style-type: none"> <li>Reservation time can be set to 1 hour ~ 48 hours.</li> <li>The reservation time is incremented by one hour in 0.3 sec interval while pressing this button.</li> <li>The minimum reservation time is one hour higher than the total course duration.</li> </ol> <p><b>Example 1)</b> The minimum reservation time is two hours if the total course time is 1 hour 10 min.</p> <p><b>Example 2)</b> The minimum reservation time is one hour if the total course time is 30 min.</p> <ol style="list-style-type: none"> <li>During the reservation mode, only reservation time, reservation LED, course LED, and Door Lock LED will be on.</li> </ol>
Tub Clean	<ol style="list-style-type: none"> <li>Tub Clean course is selected when this button is pressed.</li> <li>When this button is selected again while the Tub Clean course is selected, the washing machine returns to the power on initial state.</li> </ol>

## ■ Course button operation

Course	Cycles	Water level	Water temperature	Type of rinse	Spin speed	Display time
Fuzzy	“---”	-	Cold	2 general rinses	HIGH	---
ECO	6:1:3	-	Cold	1 main rinse	HIGH	30 min
Wool	6:2:3	MEDIUM	Cold	2 general rinses	NIGHT TIME	44 min
Blanket	20:3:5	HIGH	Cold	3 general rinses	HIGH	1 hour 16 min
Sport shoes	15:2:5	LOW	Cold	2 general rinses	NIGHT TIME	47 min
Underwear	10:2:1	LOW	Cold/Hot	2 general rinses	NIGHT TIME	46 min
Tub clean	20:2:5	HIGH	Cold	2 general rinses	Ex. HIGH	3 hours

- ① 2 hours of Soak time is added to the Tub Clean course by default.
- ② Water temperature for Underwear course is set to Cold in single water area.
- ③ Numbers in “Cycles” column mean “Wash time (min): Number of rinse: Spin time (min)”.

Example) ECO course: six min of washing time: one rinse: 3 min of spin.

\* Main rinse cannot be selected for the Blanket course

### 3. Error displays and causes of errors

Error display	Details
E9	<ul style="list-style-type: none"> <li>This error occurs when the water level sensor frequency is over 30 KHz or below 15 KHz and also when the frequency is increased suddenly by more than 1.44 KHz in four seconds after filling up water.</li> </ul> <p>→ Water level sensor hose is off the position. (<b>This feature will be applied later after review in the future</b>)</p>
dE	<ul style="list-style-type: none"> <li>This error occurs if the door lock is not set to open or close when the door lock solenoid is operated more than 10 times.</li> <li>This error is cleared when the door is open.</li> </ul>
LE	<ul style="list-style-type: none"> <li>This error indicates that the door opens during the operation of the washing machine.</li> </ul> <p><b>Procedure to handle this error</b> Close the door then the lock is engaged and the course continues.</p>
SE	<ul style="list-style-type: none"> <li>This error indicates that the safety switch is open right before entering the spin stage.</li> </ul>
QE	<ul style="list-style-type: none"> <li>This error occurs when water is not drained for more than 15 minutes.</li> </ul>
IE	<ul style="list-style-type: none"> <li>This error occurs when the water level sensor frequency does not change by more than 0.08KHz for 10 minutes after the start of water filling, and also when the water is not filled up for 60 minutes.</li> </ul> <p><b>Procedure to handle this error</b> Open and close the door, check the water valve and water pressure, and press Start/Pause button, then the error is cleared and water will be filled again.</p>
UE	<ul style="list-style-type: none"> <li>This error occurs when the unbalance switch is activated a third time after performing the unbalance operation (water fill + wash) twice during the spin stage.</li> </ul> <p><b>Procedure to handle this error</b> Open the door, arrange the contents evenly, and close the door. Then the error will be cleared and spinning will be performed again.</p>

## ■ Errors related to the motor

Error display	Details	
<b>E5</b>	High voltage error	This error occurs when the DC-LINK voltage becomes over 500V.
<b>E6</b>	IPM Fault error	This error occurs when the current to IPM is over 17A due to various reasons.
<b>E7</b>	Motor hall sensor error	This error occurs when the hall sensor is off the position or when the hall sensor input is against the logic.
<b>E8</b>	Motor operation overloading error	This error occurs when there is no next hall sensor input within 320 msec due to overloading of the motor.
<b>b1</b>	Motor alignment error	This error occurs when the alignment of the motor at the initial stage of motor operation is against the logic.
<b>b2</b>	Motor speed control error	This error occurs when the difference between the current speed and target speed is greater than 120 RPM.
<b>b3</b>	Low voltage error	This error occurs when the DC-LINK voltage is lower than 140V.
<b>b4</b>	Motor startup overloading error	This error occurs when there is no hall sensor input within 400 msec at motor startup due to overloading or motor lock.

## 4. Various test modes

### 4-1. Electronic device operation test mode

#### 1) Procedure to enter the test mode

- Press the Wash button three times while pressing the Water+ (water level) button in the initial state.

#### 2) Operation procedure

- Use the Soak button to test various devices.

No.	Display	Test items
1	b00	Option display
2	14, 15, or 16	Wash capacity display
3	C-t	Dual/single water supply, pump/natural drain, Encoder/TACT option display
4	L_C, L_O	Door close or open
5	S-C, S_O	Safety switch close or open
6	d_C, d_O	Door lock switch close or open
7	run, frequency	Durability test running frequency display
8	b1, frequency	Hall sensor error occurrence frequency display
9	b2, frequency	IPM fault error occurrence frequency display
10	b3, frequency	Overloading error occurrence frequency display
11	b4, frequency	Motor alignment error occurrence frequency display
12	b5, frequency	Motor speed control error occurrence frequency display
13	b6, frequency	Over voltage error occurrence frequency display
14	b7, frequency	Low voltage error occurrence frequency display
15	b8, frequency	Overloading error during operation occurrence frequency display
16	LP	LAMP operation test
17	dS	Door lock solenoid operation test
18	H(--)	Hot water valve operation test
19	C	Cold water valve operation test
20	r	Fabric softner valve operation test
21	bb	Bubble pump operation test
22	d1	Drain magnet operation test
23	d2	Drain synchronous motor operation test
24	PP(--)	Pump motor operation test

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## **4-2. Spin discharge test mode**

- 1) How to enter
  - In the initial condition, press the rinsing button three times while holding down the water level button.
- 2) Control procedures
  - Using the spin dry button select the target RPM. (300 ~ 800RPM: steps of 20RPM)
  - Press the start/pause button to start spin drying.
- 3) The current RPM is displayed during operation.  
When it stops the target RPM is displayed.

## **4-3. EEPROM reset mode**

- 1) Procedure to enter this mode
  - Press the Spin speed button three times while pressing the Water level button in the initial state.
- 2) Press the Start/Pause button to reset the changed EEPROM values and to restore the values with the factory default settings.
- 3) Quite often the EEPROM values need to be changed during the experiment and development process and the modified program is usually downloaded with flash ROM writer. However, the values stored in EEPROM are not erased in this case, and they can be restored easily using this mode.
- 4) Display contents
  - “EEP → ALL → CLr” are displayed sequentially on the display

## 5. Troubleshooting

Symptom	Items to check	Resolution
Washing machine is not turned on.	Check the power supply	<ul style="list-style-type: none"> <li>• Check the power supply voltage</li> <li>• Check the power loss or circuit breaker</li> </ul>
	Check whether the fuse is blown ➡ • Replace the fuse and check the operation in the test mode to see whether the fuse is blown again	<ul style="list-style-type: none"> <li>• If the fuse is blown during water filling, measure the resistance of water supply valve and replace it if it is shorted.</li> <li>• If the fuse is blown during washing, measure the resistance of the motor and replace it if it is shorted.</li> </ul>
	Check the connection status of the connector and corrosion of the cables.	<ul style="list-style-type: none"> <li>• Replace the connector and harness</li> </ul>
	Check the input/out voltage of regulator IC on the PCB assembly. (Input: 12V, output: 6V)	<ul style="list-style-type: none"> <li>• Replace the regulator. If it does not solve the problem, replace the PCB assembly.</li> </ul>
Washing does not work.	Check motor operating noise ➡ • Check the connection status of the connector, and short failure of motor windings.	<ul style="list-style-type: none"> <li>• Replace the connector and harness.</li> <li>• Replace the motor in case of short failure.</li> <li>• Replace the PCB assembly if there is no short failure in the motor windings.</li> </ul>
Spinning does not work	Check the voltage between the terminals of the drain synchronous motor.	<ul style="list-style-type: none"> <li>• Replace the motor if it fails.</li> <li>• Replace the PCB assembly if synchronous motor is normal.</li> </ul>
Water is not filled up.	Check whether the faucet is closed.	<ul style="list-style-type: none"> <li>• Turn on the faucet.</li> </ul>
	Check for existence of foreign substances in the water supply valve.	<ul style="list-style-type: none"> <li>• Clean the filter with brush.</li> </ul>
	Check whether the connection between the hose and the water supply valve is correct	<ul style="list-style-type: none"> <li>• Correct the connection between the water supply hose and cold water valve.</li> <li>• Check the connection of the cold water hose at the nozzle.</li> </ul>
	Check the sound of water supply valve Check the contact status of the connector terminals	<ul style="list-style-type: none"> <li>• Replace the water supply valve if the water supply still fails, and fix the failure conditions to prevent the recurrence of the same failure.</li> <li>• Replace the PCB assembly if the contacts are normal and problem is not solved with the above methods.</li> </ul>

Symptom	Items to check	Resolution
Tub turning during washing	Open the door and check if the tub is rotating.	<ul style="list-style-type: none"> <li>Remove any alien substances between the lever clutch and the link valve drain.</li> </ul>
		<ul style="list-style-type: none"> <li>Disassemble the rotor and check the clutch and any damage in the coupling.</li> </ul>
		<ul style="list-style-type: none"> <li>Replace the spring lift.</li> </ul>
Water supply is not turned off	Water is continuously filled up even when the machine is turned off.	<ul style="list-style-type: none"> <li>Replace the water supply valve.</li> </ul>
	<p>After reaching the HIGH level, water supply continues.</p>  <ul style="list-style-type: none"> <li>Check whether the water level hose is folded.</li> <li>Check whether the water level hose is filled with water.</li> <li>Operation is normal when the water level is set to "Medium"</li> </ul>	<ul style="list-style-type: none"> <li>Unfold the water level hose and fix the condition.</li> </ul>
		<ul style="list-style-type: none"> <li>Air leaks from water level hose.</li> <li>Replace the water level sensor or hose.</li> <li>Replace the water level sensor.</li> </ul>
Water draining does not work	Check whether the drain hose is placed on the floor	<ul style="list-style-type: none"> <li>Lower the drain hose.</li> </ul>
	<p>Check the operation of the drain synchronous motor</p>  <ul style="list-style-type: none"> <li>Check the voltage between the terminals of the drain synchronous motor</li> </ul>	<ul style="list-style-type: none"> <li>Replace the drain synchronous motor if the terminal voltage is abnormal.</li> <li>If not, check the harness connection</li> <li>If everything is ok, then replace the PCB.</li> </ul>
		<ul style="list-style-type: none"> <li>Connect the sync motor to the link.</li> </ul>

Symptom	Items to check	Resolution
Lamp is not turned on.	• Check the failure of the lamp.	• Replace the lamp
	• Check the contact status of connector and terminals	• Replace the PCB.
	Check the levelness of the set.	• Adjust the levelness.
	Check deformation of the safety lever.	• Replace the safety lever.
	Check if the sync motor wire is tight.	• Replace the sync motor.
	Check for alien substances in the discharge valve bellows.	• Remove alien substances.
	Check operation of the sync motor and the level clutch by checking spin drying (d2) in test mode.	<ul style="list-style-type: none"> <li>• If you can move the lever switch to the spin drying location (5mm or more) then replace the sync motor.</li> <li>• If normal, then disassemble the rotor and check for damage in the coupling and replace the spring.</li> </ul>



**DAEWOO ELECTRONICS CORP.**  
686, AHYEON-DONG MAPO-GU SEOUL, KOREA  
C.P.O. BOX 8003 SEOUL, KOREA  
TELEX: DWELEC K28177-8  
CABLE: "DAEWOOELEC"

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연락처

VISION 담당 ..... 방문수(choi)

TEL : 730-0660 FAX : 730-3788